

ABSTRACT

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5        A photo-ionization detector (PID) includes a  
microprocessor, a first gas detection unit, and a second  
gas detection unit. The microprocessor controls the  
first and second gas detection units such that ambient  
gas always flows through the ionization chamber of one  
10 of the gas detection units while the flow of the ambient  
gas is closed in the ionization chamber of the other one  
of the gas detection units. The UV lamp converts oxygen  
in the closed ambient gas to ozone, which removes  
contamination in the ionization chamber with the closed  
15 ambient gas. When the PID includes only one gas  
detection unit, the microprocessor controls the gas  
detection unit such that the flow of the ambient gas in  
the ionization chamber is intermittently interrupted. A  
method of real-time self-cleaning and measuring of a  
20 volatile gas concentration with the PID includes flowing  
the ambient gas through the ionization chamber of the  
first gas detection unit, so that the PID measures the  
volatile gas concentration, and stopping the ambient gas  
through the ionization chamber of the second gas  
25 detection unit so that the ambient gas is closed in the  
ionization chamber of the second gas detection unit  
while the ambient gas flows through the ionization  
chamber of the first gas detection unit. The UV lamp  
converts oxygen contained in the ambient gas in the  
30 ionization chamber of the second gas detection unit to  
ozone, which removes contamination in the ionization  
chamber of the second gas detection unit.